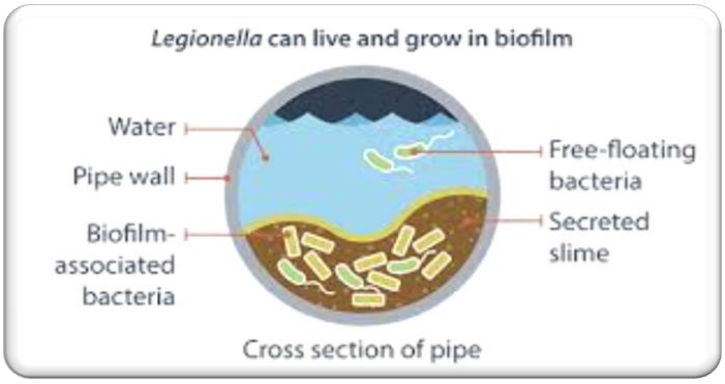
**MassDEP Drinking Water Program**
**LEGIONELLA**
**FREQUENTLY ASKED QUESTIONS, INFORMATION and RESOURCES**
**for PUBLIC WATER SUPPLIERS**

## What is *Legionella?*

*Legionella* is a bacteria found naturally in freshwater environments at generally low levels, but can become a health problem when amplified in building water systems, especially large, complex water systems such as hotels, hospitals, and office buildings. When *Legionella* grows in the biofilm of premise plumbing and is aerosolized through devices such as showers, cooling towers, hot tubs, or fountains, people can breathe in small, contaminated water droplets. Inhalation of *Legionella* may result in a severe form of pneumonia known as Legionnaires' disease, or in milder Pontiac fever.

## What is Legionnaires' disease?

Legionnaires' disease (LD) is a serious type of pneumonia (lung infection) caused by *Legionella* bacteria. People can get sick when they breathe in mist or accidently swallow water into the lungs containing *Legionella*.
More information on Legionella can be found on the Center for Disease Control's website at:
http://www.cdc.gov/legionella/index.html.





## What environmental conditions favor the spread of *Legionella*?

*Legionella* thrive in the temperature range of 77° F to 130° F, a range that includes hot water systems, shower heads and even cold-water systems in warm climates. The recommended energy saving step of lowering hot water heater temperatures below 120° F will have the unintended consequence of favoring *Legionella* growth. *Legionella* also thrive in stagnant water conditions and heating and cooling systems that produce aerosols.

## *Legionella* Outbreaks

*Legionella* is the leading cause of waterborne disease outbreaks in the United States. Outbreaks can be severe, especially in susceptible populations, causing hospitalization and death. Outbreaks are commonly associated with buildings or structures that have complex water systems, like hotels and resorts, long-term care facilities, hospitals, and cruise ships. The most likely sources of infection include water used for showering, hot tubs, decorative fountains, and

cooling towers (structures that contain water and a fan as part of centralized air-cooling systems for a building or industrial processes). Multiple outbreaks have been associated with health care facilities, and because of the sensitive populations that reside there, health care agencies have some of the most robust policies on *Legionella* control.

## MassDEP Regulations and *Legionella*

For surface water sources only, *Legionella* is regulated under the Surface Water Treatment Rule (SWTR), 310 CMR 22.20, with a maximum contaminant level goal (a non-enforceable guideline) of zero *Legionella* organisms for drinking water and a treatment technique for *Legionella* control (e.g., filtration and maintenance of a detectable disinfectant residual). No monitoring for *Legionella* is required.

310 CMR 22.03(3) of the Massachusetts Drinking Water regulations states that facilities served by a public water system that meet criteria that might otherwise make them a consecutive water system do not need to be regulated by MassDEP if they meet five criteria, the first of which is that they do not treat the water. Facilities that install permanent or temporary treatment must comply with the Massachusetts Drinking Water Regulations.
For details of this process and areas of responsibility, please contact your local MassDEP Office serving your public water system. For more information on minimum permitting for installation of permanent or temporary treatment on a consecutive public water system, see https://www.mass.gov/info-details/public-drinking-water-system-operations#system-development-.

## Massachusetts Department of Public Health (MDPH) requirements and *Legionella*

Legionellosis (another name for Legionnaire's disease) is a notifiable disease in Massachusetts. Local boards of health (LBOH), healthcare providers, laboratories and other public health personnel must report the occurrence of notifiable diseases as required by Massachusetts General Laws, Chapter 111, Sections 3, 6, 7, 109, 110, 111 and 112 and Chapter 111D, Section 6 to the Massachusetts Department of Public Health (MDPH). MDPH reviews all reported cases and works with the LBOH to determine if it is necessary to contact the local public water supplier and MassDEP. Even though *Legionella* is primarily a premise plumbing issue, if MDPH and the LBOH determine that the local public water system needs to be evaluated, MassDEP and the public water system will be notified and MassDEP will work with all parties to resolve the issue.
All *Legionella* health complaints or questions should be referred to the LBOH and MDPH.

- For a list of local Boards of Health see: https://www.mahb.org/boards-of-health/.

For more information on infectious disease surveillance, reporting and control in MA, see: https://www.mass.gov/infectious-disease-surveillance-reporting-and-control.

## How has the U.S. Department of Health and Human Services, Centers for Medicare & Medicaid Services (CMS) sought to control *Legionella*?

The CMS issued a revised Survey and Certification letter on July 6, 2018 that outlines the expectations for healthcare facilities to have Water Management Policies and Procedures (LTC) to reduce the risk of growth and spread of Legionella and other opportunistic pathogens. The policy was also intended to provide general awareness on *Legionella* and other pathogens for all healthcare organizations. Facilities must have water management plans and documentation that, at a minimum, ensure each facility:

- Conducts a facility risk assessment to identify where *Legionella* and other opportunistic waterborne pathogens (e.g. *Pseudomonas, Acinetobacter, Burkholderia, Stenotrophomonas, nontuberculous mycobacteria, and fungi*) could grow and spread in the facility water system.

- Develops and implements a water management program that considers the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) industry standard and the CDC toolkit.

- Specifies testing protocols and acceptable ranges for control measures and documents the results of testing and corrective actions taken when control limits are not maintained.

- Maintains compliance with other applicable Federal, State and local requirements.

**Note: The CMS does not require water testing for *Legionella* or other opportunistic water borne pathogens. Testing protocols are at the discretion of the provider.**

**Healthcare facilities are expected to comply with CMS requirements and conditions of participation to protect the health and safety of its patients. Those facilities unable to demonstrate measures to minimize the risk of LD are at the risk of citation for non-compliance.**

A link to the revised 7/6/18 CMS Survey and Certification letter is available at the following link: https://www.cms.gov/Medicare/Provider-Enrollment-and-Certification/SurveyCertificationGenInfo/Downloads/QSO17-30-HospitalCAH-NH-REVISED-.pdf.

## How has the U.S. Department of Veterans Health Administration (VHA) sought to control *Legionella* in their facilities?

On August 31, 2014, the VHA issued a Directive to its facilities for the prevention of healthcare-associated *Legionella* Disease and Scald Injury from Potable Distribution Systems in VHA. The *Legionella* prevention activities in the Directive involve assessing risks, monitoring water quality and implementing commensurate engineering controls to limit the growth of *Legionella*. Use of engineering controls to limit *Legionella* growth include ongoing monitoring of implemented controls, validating that the control measures are effective at inhibiting *Legionella* growth, and modifying implementation or type(s), as necessary. The Directive focused on engineering controls to the overall microbiological quality of facility water, not just the inhibition of *Legionella* growth. The Directive further noted that *Legionella* growth in building potable water distribution systems is primarily suppressed by the implementation of engineering controls such as maintenance of appropriate water temperatures or biocide (e.g. residual oxidant) levels. Application of more than one control may be necessary for the successful inhibition of *Legionella* growth.

For more information see the VHA Directive at www.va.gov/vhapublications/ViewPublication.asp?pub_ID=3033.

## Other Resources

- ASDWA

The Association of State Drinking Water Administrators (ASDWA) developed a paper on what Building/Facility Water Systems Operators should know about the management of *Legionella*. The white paper highlights the issues surrounding buildings that install treatment and are then considered public water systems under the Safe Drinking Water Act (SDWA) and subject to SDWA requirements. "Reducing exposure and controlling Legionella…… In buildings where Legionella has grown in the premise plumbing, the water provided by the public water system is a likely initial source. There are currently efforts to conduct a study monitoring for Legionella in the water in the distribution systems of public water systems that will provide a better understanding of the occurrence of Legionella in a distribution system. Regardless of whether the public water system is the original source of the Legionella found in premise plumbing, water systems can support control of Legionella and other opportunistic pathogens by providing water with optimal disinfectant residuals to all customers."
For details see:
Building Water System Operators White Paper; May 2019
https://www.asdwa.org/legionella/
Tools and resources for reducing *Legionella*:
https://www.asdwa.org/wp-content/uploads/2018/10/ASDWA-Legionella-Fact-Sheet.pdf

- AWWA:
  Research on disinfection residuals and *legionella*
  LeChevallier-2019-AWWA_Water_Science - Occurrence of Culturable Legionella in drinking water distribution system located at https://awwa.onlinelibrary.wiley.com/doi/full/10.1002/aws2.1139
  ***Please note: "The data suggest that, to prevent elevated concentrations of L. pneumophila, utilities should maintain at least a 0.1 mg/L in all parts of the distribution system."***

- EPA:
  Information for Consumers on *Legionella*
  https://www.epa.gov/ground-water-and-drinking-water/legionella
  Technologies for *Legionella* Control on Premise Plumbing Systems
  https://www.epa.gov/ground-water-and-drinking-water/technologies-legionella-control-premise-plumbing-systems

- CDC: Surveillance for Waterborne Disease Outbreaks Associated with Drinking Water — United States, 2013–2014
  https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5679581/.

- CDC practical Toolkit: Developing a Water Management Program to Reduce Legionella Growth and Spread in Buildings. https://www.cdc.gov/legionella/wmp/toolkit/index.html
  The CDC *Legionella* web page has a wealth of other information about *Legionella*, health concerns, and control and remediation.

- CDC: Legionnaires Disease ASHRAE FAQs https://www.cdc.gov/legionella/health-depts/ashrae-faqs.html.

- CDC: A Training on *Legionella* Water Management Programs (PreventLD Training). Anyone who is involved with water safety for buildings should take this course.
  https://www.cdc.gov/nceh/ehs/elearn/prevent-LD-training.html.

- MDPH Fact Sheet on Legionellosis

https://www.mass.gov/service-details/legionellosis-legionnaires-disease

- MDPH Guide to Surveillance, Reporting, and Control for Local Health Departments
  https://www.mass.gov/handbook/guide-to-surveillance-reporting-and-control

- MDPH Infectious Disease Reporting and Regulations for Healthcare Providers and Laboratories
  https://www.mass.gov/lists/infectious-disease-reporting-and-regulations-for-health-care-providers-and-laboratories#regulations-and-summary-of-recent-amendments-(2017)-

- MDPH specific list of facilities that BHCSQ licenses or certified is found here:
  https://www.mass.gov/doc/list-of-health-care-facilities-licensed-or-certified-by-the-division/download

- MDPH web page about licensed or certified health care facilities background information:
  https://www.mass.gov/service-details/find-information-about-licensed-or-certified-health-care-facilities

- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASRAE)
  Building water management plans can also reduce and control Legionella growth in building water systems. These plans include a description of the building water system, a team to develop and manage the plan, control measures, and monitoring to verify that the plan is working. The most recognized industry standard for building water systems management plans is ASHRAE 188.

    - ANSI/ASHRAE Standard 188-2018: "Legionellosis: Risk Management for Building Water Systems:
      https://webstore.ansi.org/Standards/ASHRAE/ANSIASHRAEStandard1882018?gclid=EAIaIQobChMI5ILyyrOw5QIVAYbICh1s-APHEAAYASAAEgIAqPD_BwE (fee required).

    - ANSI/ASHRAE Standard 188-2015:
      file:///C:/Users/FRNILES/AppData/Local/Microsoft/Windows/INetCache/Content.Outlook/PI0F48H2/ASHRAE-188-2015.pdf (free)

- NSF International: NSF International is also working on Standard NSF 444 for Prevention of Injury and Disease Associated with Building Water Systems.

    - NSF International Standard to Address Legionnaires' Disease Risks Described by U.S. CDC,
      http://www.nsf.org/newsroom/nsf-international-standard-to-address-legionnaires-disease-risks